

SH2100

HIGH CURRENT DRIVER

HYBRID CIRCUITS

GENERAL DESCRIPTION - The SH2100 Hybrid consists of a Buffer Micrologic® Integrated Circuit driving a high-current NPN Planar* Epitaxial Silicon Transistor.

*Planar is a patented Fairchild process.

- 135 mA CURRENT SINK
- INPUT COMPATIBLE WITH μL , MW μL , DT μL , AND CT μL
- OPERATES AT 12V
- FAN-OUT = 200 μLOGIC LOADS

ABSOLUTE MAXIMUM RATINGS (25°C Free Air Temperature unless otherwise noted)

Maximum Temperatures

Storage Temperature

-65°C to +150°C

Operating Temperature

-55°C to +125°C

Maximum Voltages

Maximum Voltage Applied to Pin 8

+12 Volts

Maximum Voltage Applied to Pin 3

± 4 Volts

Maximum Voltage Applied to Pin 5 V_{CBO}
 V_{CEO}

+30 Volts

+12 Volts

Maximum Total Power Dissipation at 25°C Ambient

500 mW

Typical Power Dissipation at 25°C Ambient

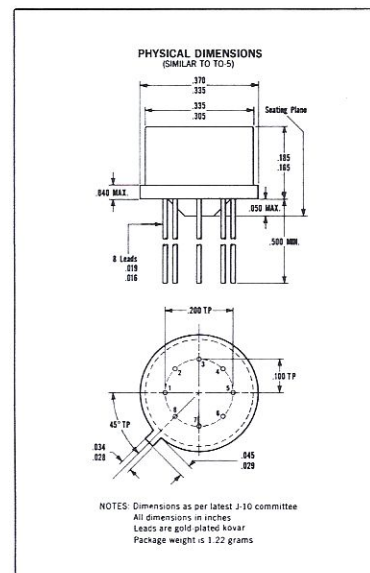
65 mW

Maximum Current Applied to Pin 5

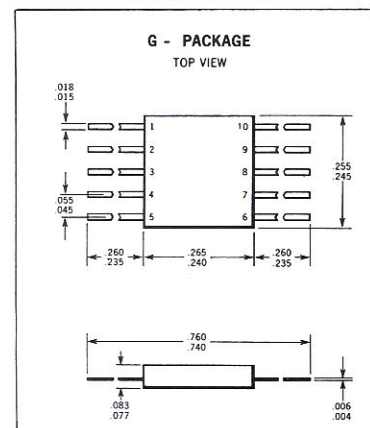
500 mA

Maximum Fan-out ($R_{out} = 20 \Omega \pm 5\%$) into RTL Micrologic

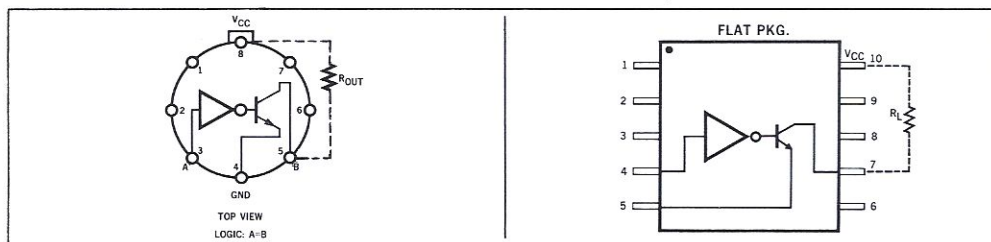
200



PART NO. HXK21001XX -55°C TO +125°C
HXK21009XX 0°C TO +70°C



PART NO. HBG21001XX -55°C TO +125°C
HBG21009XX 0°C TO +70°C



DC ACCEPTANCE TEST CONDITIONS

Test No.	Test Title	Units	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Test Limits Min. Typ. Max.
1	I_3	mA			V_{IN}	GND				V_{CC}	$2 I_{IN}$
2	V_5	V			V_{OFF}	GND	V_{R2}			V_{CC}	V_{out}
3	I_5	mA			V_{ON}	GND	V_{max}			V_{max}	I_{CEX}
4	t_{3+5+}				See Switching Time Test Circuit						80 nsec
5	t_{3-5-}				See Switching Time Test Circuit						70 nsec

DC ACCEPTANCE TEST LIMITS

Symbol*	Test Tolerance	-55°C ± 2°C	25°C ± 2°C	+125°C ± 2°C
V _{CC}	± 0.010 V	3.00 V	3.00 V	3.00 V
V _{IN}	± 0.002 V	1.014 V	0.844 V	0.674 V
V _{ON}	± 0.002 V	1.014 V	0.815 V	0.674 V
V _{OFF}	± 0.002 V	0.710 V	0.565 V	0.320 V
V _{R2}	± 0.01 Ω	20 Ω	20 Ω	20 Ω
V _{out}		0.710 V	0.300 V	0.320 V
V _{max}	± 0.01 V	12.0 V	12.0 V	12.0 V
2I _{IN}		0.990 mA	0.870 mA	0.940 mA
I _{CEX}		0.100 mA	0.218 mA	0.235 mA

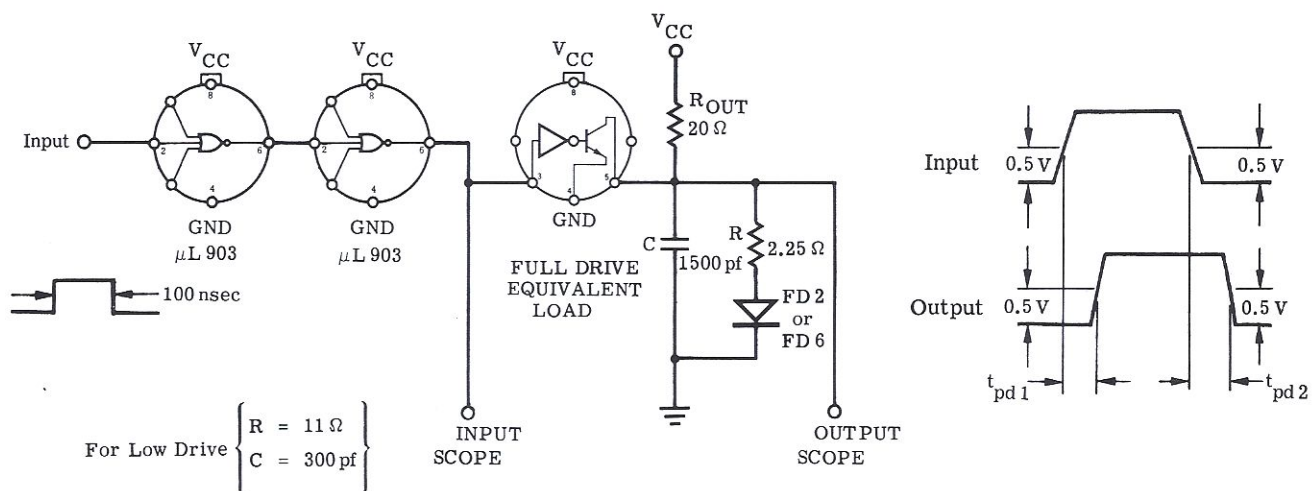
*For definition of the symbols refer to standard Fairchild Micrologic specification.

TESTS FOR END POINTS GROUP B 1, 2, 3

LTPD's	Test 1	10% 25°C	15% -55° & +125°C
Group A	Test 2	10% 25°C	15% -55° & +125°C
	Test 3	10% 25°C	15% -55° & +125°C

NOTE: Fairchild Assured Customer Test Programs are identical to latest issue Epitaxial μ Logic Tentative Specifications.

SWITCHING TIME TEST CIRCUIT



NOTE: FULL DRIVE IS EQUIVALENT TO FAN-OUT OF 200 MICROLOGIC GATES.
LOW DRIVE IS EQUIVALENT TO FAN-OUT OF 40 MICROLOGIC GATES.

RULES FOR SELECTING VALUES OF R_{OUT}

(Applicable over -55°C to $+125^{\circ}\text{C}$ temperature range.)

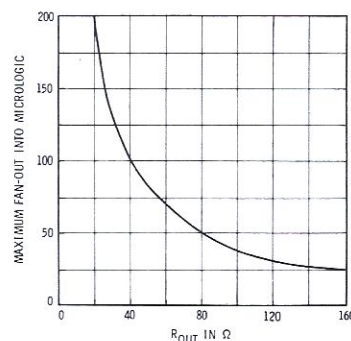
Primary consideration is to minimize overdrive to driven elements and reduce power drain.

A. MICROLOGIC Elements

$$R_{out}(\text{min}) = 20\ \Omega \pm 5\%$$

$$R_{out} = \frac{4,000}{\text{Max Fan-out Used}}\ \Omega$$

FANOUT MAXIMUM VS. R_{OUT}

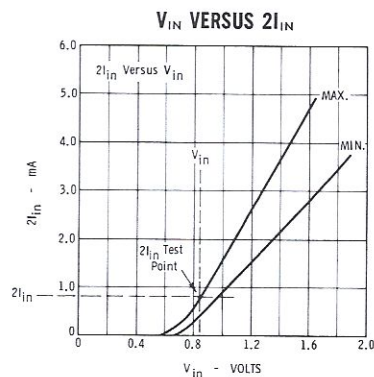
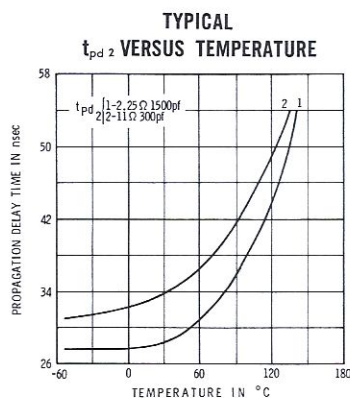
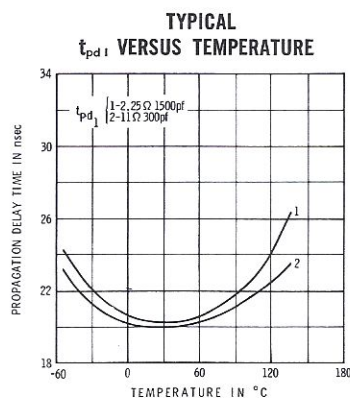
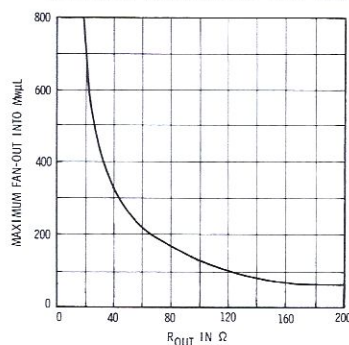


B. MW μ L Elements

$$R_{out}(\text{min}) = 20\ \Omega \pm 5\%$$

$$R_{out} = \frac{13,000}{\text{Max. Fan-out Used}}\ \Omega$$

FANOUT MAXIMUM VS. R_{OUT}



FAIRCHILD HYBRID CIRCUITS SH2100

APPLICATIONS-When driven from standard MICROLOGIC

Input Loading = 2 when driven
Factor from Micrologic
= 6.0 when driven
from MW μ L

